27. (New) The method according to claim 25, further comprising:

numbering the plurality of different data records in a sequence in which they are stored in the storage device, identifying characters of each of the plurality of data records being formed from the numbering.

28. (New) The method according to claim 15, further comprising:

using protocols in the terminal and the matching device which include functional elements for a predefined transmission mode for the transmission of a message; and

effecting a suitable signaling of the message for the terminal.

29. (New) A matching device for a transmitting messages between at least one main station and terminal via a telecommunications network, comprising:

at least one interface to the at least one main station;

an interface to the terminal;

a storage device configured to store at least one input from one of the terminal and the at least one main station for controlling a message exchange between the at least one main station and the terminal; and

a control unit configured to control the message exchange as a function of the at least one input.--.

REMARKS

This Preliminary Amendment cancels without prejudice original claims 1-14 in the underlying PCT Application No. PCT/DE00/02780, and adds without prejudice new claims 15-29. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. § 1.121(b)(3)(iii) and § 1.125(b)(2), a Marked-Up Version of the Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) is respectfully requested.

The underlying PCT Application No. PCT/DE00/02780 includes an International Search Report, dated February 5, 2001. The Search Report includes a list of documents that were uncovered in the underlying PCT Application. Also, the underlying PCT Application No. PCT/DE00/02780 includes an International Preliminary Report, dated January 3, 2002. English translations of the Search Report and Preliminary Report accompany this Preliminary Amendment.

Applicants assert that the subject matter of the present application is new, non-obvious, and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully Submitted,

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Dated: _____

By: _____
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METHOD OF TELECOMMUNICATION BETWEEN AT LEAST ONE MAIN STATION
AND ONE TERMINAL, AND MATCHING DEVICE THEREFOR

[Background Information] FIELD OF THE INVENTION

The present invention relates to a method of telecommunication
between at least one main station and one terminal, and to a
matching device [therefor, according to the species defined in
5   the independent claims.].

BACKGROUND INFORMATION

Methods of telecommunication between one main station and one
terminal are [already known] conventional.

10

In the so-called Internet e-mail Service, messages are created
by a so-called mail client and are transmitted via the
Internet to a mail server of a recipient using the so-called
SMTP (simple mail transfer protocol) according to RFC 821
15   (request for command) of the IETF (Internet Engineering Task
Force), or using the ESMTP (enhanced simple mail transfer
protocol) according to RFC 1869 of the IETF. The recipient can
access the transmitted message from the mail server, also with
the aid of a mail client. Appropriate protocols are used for
20   access to the transmitted message, for instance, POP (post
office protocol) according to RFC 1729 of IETF, or IMAP
(Internet message access protocol) according to RFC 2060 of
IETF, or even protocols specific to manufacturers. These
protocols regulate the exchange of messages between the
25   recipient and the mail server, such as, for instance, the
logging on of a mail client to the mail server, authentication
of the mail client, etc. For transmission of messages from
mail server to mail client, [mostly] SMTP or ESMTP are

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generally used. In order to register new messages on the mail
server, the mail client checks the mail server sporadically or
regularly. This procedure is [also denoted as] called polling.
If the mail client [in this manner] detects messages present

5 on the mail server for the user of the mail client, it signals
this to the user. The user can then initiate access to the
message stored for him on the mail server. The initiation of
access is also called pull mode. The message is then
transmitted from mail server to mail client and can be

10 reproduced there for the user. The method described here is
intended essentially for dedicated connections, where the mail
client has a permanent connection to the e-mail server, or a
connection with relatively brief interruptions. SMTP was
originally provided for text messages, [By] by the use of MIME

15 (multipurpose Internet mail extensions) according to RFC 1521
of IETF, such messages can be expanded by attachments. In
this connection, the attachments can have any format desired,
and are not limited to text messages. However, for
transmission, these messages are recoded so that they can also

20 be transmitted in the form of simple text messages.

The SMS service (short message service) according to the GSM
standard (global system for mobile communications), GSM 03.40
ETSI differs fundamentally from the internet e-mail service

25 described. It is limited exclusively to text messages having a
maximum length of 160 characters, there being (the possibility
of) expansions by concatenation of a plurality of such text
messages. The SMS service is further based on transmitting the
text message from an SMS transmitter to an SMS server, which

30 then automatically transmits it to a mobile terminal. This
method is also denoted as push mode. If the mobile terminal in
the mobile radio network is not available, for instance,
because it is switched off, the message is stored temporarily
in the SMS server. Following that, when the mobile terminal

35 can be reached again, this is signaled to the SMS server, and
it automatically begins transmission of the text message to

the mobile terminal.

[Summary of the Invention] SUMMARY

[The method according to]According to an example embodiment

5   of the present invention [and the matching device according to
the present invention], [having the features of the
independent claims, by contrast, have the advantage that] the
message exchange by a matching device between [the] at least
one main station and the terminal [is] may be controlled in

10   dependence on at least one input from the terminal or from the
at least one main station. The use of the matching device
[makes] may make possible the matching of main stations or
servers of various services to one terminal, without having to
establish a direct connection between the terminal and each

15   respective main station, and without [its] it being necessary
to transmit between terminal and each respective main station
service-specific protocols and thus different protocols
depending on the [particular] main station involved. [On
account of the method according to the present invention and

20   the matching device according to] According to the example
embodiment of the present invention, the respective main
station is not visible to the terminal[, but]; only the
matching device is visible. Thus, various services for message
exchange between terminal and various main stations may be

25   integrated by the matching device, so that a uniform message
exchange between the terminal and the matching device becomes
possible for the implementation of various services. In [both]
the case where only one single main station is connected to
the matching device, and the case where a plurality of main

30   stations are connected to the matching device, the [advantage
may be effected that the] matching device [can] may match the
message exchange between each respective main station and the
terminal to inputs from the user of the terminal, to the
properties and capability of the terminal or to inputs from

35   the respective main station. In this [way] manner, the message
exchange [can] may be individually and flexibly optimized in

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dependence upon user inputs or equipment properties for each connection to be established between a main station and a terminal.

5   By the use of the matching device, service-specific features for the message exchange between the terminal and the respective main station [are cancelled] may be canceled out and replaced by user-specific features, which, for transmission of messages to the terminal, may be defined by an
10   input from the terminal, or rather, the user of the terminal.

       [By the measures described in the dependent claims, advantageous further developments and improvements of the method for transmitting messages between at least one main
15   station and one terminal and the matching device according to the independent claims are possible.

       Thus, for example, in an advantageous manner, a] A transmitting mode independent of the service used may be input
20   by the user of the terminal, so that by means of the matching device, for example, even in SMS service a pull mode [can] may be realized, and in Internet e-mail service a push mode [can] may be realized.

25   [It is particularly advantageous that a] A plurality of messages, [particularly] from different main stations[, are] for example, may be transmitted jointly by the matching device to the terminal in different modes. In this manner, clarity upon receipt of the messages [is] may be enhanced for the
30   user, and it avoids having to activate the terminal several times for receiving messages from various main stations.

       [A further advantage is that the] The matching device [segments] may segment individual parts of a message which
35   includes a plurality of elements and processes them, depending upon the input from the terminal. In this manner, automatic,

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user-individual preprocessing of such messages [can] <u>may</u> be
implemented which requires no input from the user at the
terminal, as long as the input for processing of such messages
is not to be changed.

5

[It is also particularly advantageous that a] <u>A</u> plurality of
different data records [can] <u>may</u> be input by a user of the
terminal for various functionalities implementable using the
terminal, and [can] <u>may</u> be stored in a storage device assigned

10   to the matching device. In this [way,] <u>manner,</u> one [can] <u>may</u>
match the message exchange between each main station and the
terminal to the properties and the capability of various
terminal configurations via the matching device. [Because of]
<u>Due to</u> the storage of the data records in the storage device,

15   [they do] <u>the data records may</u> not have to be transmitted each
time a connection is established between the terminal and the
matching device, but only have to be selected in the storage
device, which [saves] <u>may save</u> transmitting capacity.

20   [It is also of advantage that the] <u>The</u> terminal user [selects]
<u>may select</u> a data record[; that the]<u>. The</u> terminal
[transmits] <u>may transmit</u> the characterizing identification
character of the selected data record to the matching device[;
that a]<u>. A</u> check is performed in the matching device[,

25   whether a]<u>. A</u> data record [having] <u>including</u> the identifying
character received [is] <u>may be</u> stored in the storage device[;
and that, if]<u>. If</u> the data record associated with the
identifying character received is present in the storage
device, then this data record [is] <u>may be</u> selected. In this

30   manner, only the appropriate identifying character [has] <u>may
have</u> to be transmitted from the terminal to the matching
device for the selection of the desired data record, so that
the data volume required to be transmitted for the selection
of the desired data record [is] <u>may be</u> minimized, and the

35   transmitting capacity [is] <u>may be</u> impaired as little as
possible.

[It is of particular advantage that the] The data records
[are] may be numbered in the sequence in which they are stored
in the storage device, the identifying character of the data
records [being] may be formed in each case from this

5 numbering. This [provides] may provide a very simple and not
very costly possibility to form identifying characters, the
identifying characters thus may be formed [being] in each case
formed as a number, and therefore [requiring] may require an
especially low quantity of transmitting capacity for their

10 transmission.

[Brief Description of the Drawings] BRIEF DESCRIPTION OF THE
DRAWINGS

[An exemplary] An example embodiment of the present invention

15 is represented in the drawings and explained in detail in the
following description. [The Figures show:]

Figure 1 is a schematic representation of an integration of
various information networks for an integrated multimedia

20 message service.

Figure 2 is a block diagram of a matching device according to
the present invention for [carrying out] performing the method
according to the present invention.

25
Figure 3 is a representation of the protocol layers in general
form required for the message exchange according to the
present invention.

30 Figure 4 illustrates the protocol layers for the message
exchange []according to the present invention in a first
[special] example embodiment.

Figure 5 illustrates the protocol layers for the message

35 exchange []according to the present invention in a second
[special] example embodiment.

Figure 6 <u>illustrates</u> the protocol layers for the message
exchange [] according to the present invention in a third
[special] <u>example</u> embodiment.

5   <u>[Description of the Exemplary Embodiment]</u> DETAILED DESCRIPTION
Within the framework of standardization of UMTS (universal
mobile telecommunications system) a multimedia messaging
system (MMS) has currently been specified according to
publication "Multimedia Messaging Service , Functional
10   Description", 3GPP TS 23.140, v.0.1.0., 3GPP Technical
Subgroup Terminals 1999-10. MMS is a service which, starting
from today's SMS service in GSM (SMS: short message service;
GSM: global system for mobile communications) is supposed to
make possible sending and receiving of messages using, for
15   example, a terminal 5 formed as a mobile phone.

Today's SMS service is limited to a maximum of 160 characters
per message, and only text can be transmitted, that is, there
exists a limited character set that can be used.
20
In contrast to an SMS, an MM (multimedia message) is not to be
limited either to a certain length or to text representation.
Instead, MM is supposed to support multiple media types.

25   In the MMS service, a matching device denoted as MMS relay has
a central function. This element may be connected, via media
of the greatest difference, to different kinds of main
stations 1, 2, 3 denoted as servers or service providers, such
as an e-mail server, fax server, voice mailbox, MMS server or
30   the like, as [shown] <u>illustrated</u> in Figure 2. [Its] <u>The</u>
purpose is to make accessible to the user of terminal 5 all
such information/messages as are present on the servers named.

Thus, via MMS relay 15, the user of terminal 5 [has] <u>may have</u>
35   access to his e-mails lying in an e-mail server, to faxes
"waiting" for him on a fax server, and to voice messages

recorded for him on a voice mailbox.

Aside from the receipt of messages, however, it is also
intended that the user may be able to write messages and send
5   these to the desired recipient via MMS relay 15.

Figure 1 [shows] illustrates schematically an MMSE (multimedia
messaging service environment), such as [can] may be provided,
for example, for mobile radio systems according to the UMTS
10   standard (universal mobile telecommunications system) or
according to the GSM standard (global system for mobile
communications). In this connection, MMSE represents a system
in which new and existing services such as mobile radio
telephony, fixed network telephony, Internet and the like
15   [are] may be integrated, and the separation, existing up to
now, of the individual services within the various networks
has been lifted. Furthermore, the mobile radio telephony
service in Figure 1 is [shown] illustrated as two mobile radio
networks, each denoted as a "cellular network". The fixed
20   network telephone service is [shown] illustrated in Figure 1
as fixed network, and characterized by the term "fixed
network". Internet service is [shown] illustrated and denoted
as "Internet" in Figure 1. According to the example as in
Figure 1, the MMSE [here] incorporates all the networks or
25   services [shown] illustrated. In addition, the MMSE includes
various service elements which may be flexibly implemented in
any of the networks [shown.] illustrated. Matching device 15
as shown in Figure 2, may be such a service element.

30   [Matching device 15 as in Figure 2, already mentioned, is such
a service element. Matching] Referring now to Figure 2,
matching device 15 includes a control unit 30, to which a
storage device 25 [is] may be connected. Furthermore, a fourth
interface 20 to a terminal 5 [is] may be connected to control
35   unit 30, fourth interface 20, for instance, [being perhaps]
may be an air interface or a wireless interface, and terminal

5 [being perhaps] <u>may be</u> a mobile terminal, for instance, in
the form of a mobile phone. The exchange of data between
terminal 5 and fourth interface 20 [takes place] <u>occurs</u> over a
telecommunications network 10, which may be [designed]

5   <u>configured</u> as a mobile radio network, if fourth interface 20
is a wireless interface and terminal 5 is a mobile terminal.
[But it can also be provided that] <u>Alternatively,</u>
telecommunications network 10 [is] <u>may be</u> a fixed network, and
[that] terminal 5 as well as fourth interface 20 [are] <u>may be</u>

10   wire-bound. In the following, however, there is described as
an example the case in which fourth interface 20 is wireless
and terminal 5 is mobile.

In addition, a first interface 11, a second interface 12 and a

15   third interface 13 [are] <u>may be</u> connected to control unit 30.
A first main station 1 [is] <u>may be</u> connected to matching
device 15 via first interface 11. A second main station 2 [is]
<u>may be</u> connected to matching device 15 via second interface
12. A third main station 3 [is] <u>may be</u> connected to matching

20   device 15 via third interface 13.

In this connection, each of main stations 1, 2, 3 [provides]
<u>may provide</u> one or more services. The services provided by
main stations 1, 2, 3 thus differ from one another in the

25   [exemplary] <u>example</u> embodiment described here. [Now, in] <u>In</u>
order to be able to [take advantage of] <u>use</u> a service from one
of main stations 1, 2, 3, terminal 5 does not have to
establish in each case a service-specific connection to the
appropriate main station. Rather, terminal 5 establishes a

30   connection to matching device 15, for each service to be
[taken advantage of] <u>used</u>, and it converts the various
services of main stations 1, 2, 3 into a uniform style for
terminal 5. This uniform style [can] <u>may</u> be input by terminal
5 or rather the user of terminal 5, and [can] <u>may</u> be

35   transmitted by terminal in the form of a data record via
telecommunications network 10 to matching device 15, and

stored in storage device 25.

In the following, [let] <u>assume the</u> first main station 1 [be] <u>is</u> provided, for example, for an electronic postal service, such as e-mail. [Let] <u>Assume the</u> second main terminal 2 [be] <u>is</u> provided, for instance, for an SMS service. [Let] <u>Assume,</u> <u>the</u> third main station 3 [be] <u>is</u> provided, for instance, for a fax mail service. Now, for example, [let] <u>assume</u> the input from terminal 5 [be] <u>is</u> stored in storage device 25, <u>such</u> that messages from matching device 15 to terminal 5 are to be transmitted in the form of SMS messages. In another <u>example</u> embodiment, in a corresponding manner in the opposite direction, SMS messages in the form of e-mail could also be transmitted by matching device 15 to terminal 5. Furthermore, the input of terminal 5 stored in storage device 25 may provide that the messages are transmitted in the pull mode described from matching device 15 to terminal 5, that means, then, only at the prompting of terminal 5. A message received in first main station 1 for terminal 5 [is] <u>may be</u> recognized by control device 30, on account of appropriate signalling from first main station 1. Subsequently, matching device 15 signals terminal 5 via telecommunications network 10 that there is a message for terminal 5 in first main station 1. By sending an appropriate prompting signal via telecommunications network 10, terminal 5 [can] <u>may</u> thereafter prompt matching device 15 to transmit the message present in first main station 1. At the detection of this prompting signal, control unit 30 induces first main station 1 to transmit the message present for terminal 5. If, for example, this message is present as e-mail, control unit 30 recognizes this. According to the input from terminal 5 stored in storage device 25, control unit 30 converts the e-mail message to one or more SMS messages, depending on the length of the e-mail message. This SMS message or these SMS messages may, as necessary, also be stored temporarily in storage device 25 via telecommunications network 10, when terminal 5 is temporarily inaccessible.

Transmission of the SMS message or of the SMS messages by
matching device 15 to terminal 5 then [takes place] <u>occurs</u>
when terminal 5 is accessible, and, as described, on the
assumption that the prompting signal was detected by control
5   unit 30.

In a corresponding manner, control device 30 converts a fax
message received by third main station 3 via third interface
13 to one or more SMS messages, and sends these, after
10   prompting by terminal 5, via fourth interface 20 and
telecommunications network 10 to terminal 5.

An SMS message received at matching device 15 from second main
station 2 via second interface 12 [is] <u>may be</u> recognized as
15   such by control unit 30, and thus [does] <u>may</u> not need to be
converted, but may, after prompting by terminal 5, be
transmitted, in the pull mode described, via fourth interface
20 and telecommunications network 10 to terminal 5.

20   In corresponding fashion, control device 30 may recognize
messages that were received from terminal 5 via
telecommunications network 10 and fourth interface 20 at
matching device 15, and convert them, according to an input
from a main station addressed by these messages, to a format
25   requested by this main station and transmit them to this main
station, e.g., text to voice mail or text to fax. In this
connection, the inputs made by the respective main stations
may also be stored in storage device 25. The inputs of a
plurality of main stations may also be stored there.
30

With the aid of Figure 3, <u>an example embodiment of</u> the present
invention is represented at the protocol level and described
in greater detail. Here, [Terminal] <u>terminal</u> 5 is also denoted
as MMS client (multimedia message service). [According to] <u>In</u>
35   Figure 3 and as described, matching device 15 [is] <u>may</u> also <u>be</u>
denoted as MMS relay. In Figure 3, for example, first main

station 1, also denoted as MMS server, is supposed to be
connected to matching device 15. Fourth interface 20 as an air
interface between terminal 5 and matching device 15 is denoted
in Figure 3 as U_u. First interface 11 for connecting first main

5   station 1 to matching device 15 is denoted in Figure 3 as IP
interface (internet protocol). Matching device 15 and first
main station 1, which was selected in this example to
substitute for all main stations connected to matching device
15, form the described MMSE, in this connection.

10

The MMS server and MMS relay 15 [do] may not necessarily have
to be separated from each other as illustrated in Figure 3,
but may also form one physical unit. Separation of MMS relay
15 and MMS server according to Figure 3, or a distributed

15 arrangement of the two elements [is particularly] may be
sensible if, in the case of the MMS server, and Internet
e-mail server is involved. In this case, MMS relay 15 and the
MMS server are connected to each other via the usual protocol
layers. In this connection, MMS relay 15, on the side of air

20 interface U_u, includes a first protocol layer sequence which
corresponds to the protocol layer sequence of terminal 5.
Furthermore, MMS relay 15 includes a second protocol layer
sequence on the side of the IP interface, which corresponds to
the protocol layer sequence of first main station 1. In this

25 context, as MM transfer protocol (multimedia messaging) an
upper protocol layer is generally denoted, which, for example,
may [designed] be configured as SMTP or ESMTP or even in a
manufacturer-specific manner. Here, the MM transfer protocol
on the side of air interface U_u [can] may differ from MM

30 transfer protocol on the side of the IP interface. The MM
transfer protocol on the side of air interface U_u is therefore
characterized by I in Figure 3, and the MM transfer protocol
on the side of the IP interface is characterized by II, in
order to take account of this circumstance. In this

35 connection, for example, MM transfer protocol II may be
developed as an SMTP and MM transfer protocol I may be

developed for transmission of SMS messages, in order to
realize the application described in Figure 2. On the side of
the IP interface, the upper layer [is] <u>may be</u> subdivided into
MM transfer protocol II and TCP/UDP (transmission control

5 protocol/user datagram protocol). The lower layer is generally
denoted as lower layer, and [is] <u>may be</u> used for developing
and establishing a connection between matching device 15 and
terminal 5 on the one hand, as well as between matching device
15 and the respective main station on the other hand, and [is]

10 <u>may</u> also <u>be</u> adapted to the type of messages to be transmitted
via the appropriate interface. So, for example, the lower
layer assigned to the IP interface according to Figure 3 is
developed as an IP (Internet protocol) and the lower layer
lying below it.

15

In this context, MMS relay 15 [carries out] <u>performs</u> a
matching of the message exchange between the MMS server and
the MMS client. In this context, for one message which is to
be sent from the MMS server to the MMS client, the second

20 protocol layer sequence 40 of MMS relay 15 [is] <u>may be</u> run
through from bottom to top. Subsequently a change of form of
the message [takes place] <u>occurs</u> in MMS relay 15, according to
the input of terminal 5. Thereafter, the message thus changed
in form runs through the first protocol layer sequence 35 of

25 MMS relay 15, assigned to air interface U_u, from top to bottom,
so that the message [can] <u>may</u> be dispatched to the MMS client.
The protocol and message conversion runs correspondingly in
the opposite direction for messages to be transmitted from MMS
client via MMS relay 15 to MMS server. The protocol layer

30 sequence of second main station 2 and third main station 3
[can] <u>may</u> each be distinguished the protocol layer sequence of
first main station 1 as in Figure 3, second interface 12 and
third interface 13 having then assigned to them in each case
their own second protocol layer sequence 40, on the side of

35 MMS relay 15, which corresponds to the protocol layer sequence
of the connected main station. In this [way] <u>manner</u>, by use of

first interface 11, second interface 12, and third interface
13, three different protocol layer sequences [can] may be
implemented on the part of MMS relay 15, each corresponding
the protocol layer sequence of the connected main station. In
5   the system described as in Figure 3, it is essential that the
MMS client communicate with one or more MMS servers via MMS
relay 15, and vice versa. In this connection, the structure
illustrated permits, on the one hand, a flexible integration
of a plurality of different MMS servers or main stations from
10   different networks, or for different services, as for example
a fax service or a voice mail service which are implemented on
a cellular mobile radio network, and an e-mail service which
is implemented via the Internet. By the use of matching device
15, terminal 5, if it is developed as a mobile radio device,
15   for instance according to the GSM standard, may be offered,
additionally to the implementation of mobile radio-specific
functions such as SMS service, the use of standardized mail
services, such as ones according to the Internet standard of
IETF along with the protocols, methods and MMS servers
20   required for this.

The functions to be [carried out] performed by MMS relay 15
may be subdivided into several groups. A first group of such
functions [makes] may make possible the integration of
25   different services or different MMS servers by matching device
15. The MMS servers of different services, such as e-mail,
voice mail or fax send their messages via MMS relay 15, which
converts these messages into the same form, to terminal 5. In
this case it may be necessary to convert different data
30   formats, such as fax format to graphics format. However, it
may also be necessary, additionally or alternatively, to
convert the data type of such a message, for instance, to
transcribe a text message into a voice mail message, so that
the text message may be reproduced acoustically at terminal 5.
35
A second group of functions in MMS relay 15 [is] may be

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necessary for determining whether terminal 5 [can] may be
reached by matching device 15 via telecommunications network
10. For this, it [is] may be neccesary for MMS relay 15 to
have a connection to a further message element, such as an HLR

5   (home location register), in order to receive information as
to whether terminal 5 is logged on or available in
telecommunications network 10. If the respective terminal 5
cannot be reached, the message to be communicated [must] may
be stored in storage device 25. As soon as terminal 5 may be

10 reached again, and MMS relay 15 finds this out via the
described network element, MMS relay 15 automatically
continues the communicating process previously broken off by
storing the message.

15 A third group of functions relates to the transmission mode to
be set for transmitting messages from matching device 15 to
terminal 5. Here, it should be possible, on the one hand, to
transmit messages directly from matching device 15 to terminal
5 in push mode. On the other hand, it [should] may be possible

20 for terminal 5 only to be informed by matching device 15 that
a message for terminal 5 is stored in matching device 15 or in
one of associated main stations 1, 2, 3. These messages may
then be retrieved at terminal 5 via matching device 15 or
[can] may be passed on to another mail system. This

25 transmission mode corresponds to the pull mode described. The
user of terminal 5 [can] may preselect by a data record which
transmission mode [is] may be used for which message or which
data type of message, and he [can] may send this data record
to matching device 15 for storage in storage device 25. Such a

30 data record is also described as a profile. When MMS relay 15
recognizes the receipt of a new message for terminal 5 in one
of main stations 1, 2, 3, or when this is signaled to MMS
relay 15 by one of main stations 1, 2, 3, MMS relay 15 checks,
in dependence upon the profile inputs stored in storage device

35 25, in which transmission mode the message is to be
transmitted to terminal 5, such as whether in push or in pull

mode. In accordance with the input transmission mode, the transmission of the message to terminal 5 [is] <u>may</u> then <u>be</u> controlled by control device 30.

5   A further group of functions of matching device 15 relates to segmenting or combining messages. Messages may be composed of several elements, such as e-mail, which [can] <u>may</u> have different attachments. MMS relay 15 [can] <u>may</u> treat each element of a message individually, that is, under certain

10   circumstances it may pass on individual elements of the message to terminal 5, store others in storage device 25, cancel yet others, or send them on to another mail system. This method is denoted as segmentation of messages. Correspondingly, a message may be newly combined, for example,

15   from message elements from different main stations 1, 2, 3. Here, for instance, all new elements input into main stations 1, 2, 3 which are to be transmitted to terminal 5 in push mode, and all new elements input into main stations 1, 2, 3 which are to be transmitted to terminal 5 in pull mode are

20   combined, in each case, and are transmitted in the respective transmission mode to terminal 5. All message elements which are supposed to be sent to the same address, for instance, passed on in a different mail system, may be combined into a single message and passed on to this mail system. Now, whether

25   messages from different main stations should be combined to a common message, if they are to be transmitted to terminal 5 using the same transmission mode, may also be specified in a user-defined profile. The same goes for segmentation of a message of several message elements which was received from a

30   single main station for terminal 5. In this context, it may be specified by the user of terminal 5, with the aid of a profile, which data types or data formats of message elements of such a message are to be treated individually in which of the described forms. For example, all message elements in a

35   video format [could] <u>may</u> be passed on to another terminal in another mail system which [is] <u>may be</u> in a position to

reproduce the video data. Message elements having text messages [can] may be provided in this example, for dispatching to terminal 5 according to profiles, and message elements in fax form [could] may be provided according to

5   profiles, in this example, for storage in storage device 25 for later retrieval.

A message for terminal 5, input in a respective manner, for example, in first main station 1, having such attachments or

10   message elements, [is] may then be segmented according to the specifications in the user-defined profile stored in storage device 25, in order to be able to process the individual message elements of this message according to the specifications of the profile as described.

15

In general, the user-defined profile [is] may be a data record which [is] may be determined by the user of terminal 5 and may be stored in storage device 25 of MMS relay 15. It determines the behavior of MMS relay 15 and specifies which messages or

20   message elements are transmitted directly or after retrieval, i.e., in push or pull mode, to terminal 5, which messages or message elements are automatically passed on to another mail system or cancelled, which messages or message elements are converted to another format, etc. In order to be able to

25   [carry out] perform the processing provided with the aid of profiles for the messages or message elements, these messages or message elements must be able to be differentiated from one another and identified. Differentiating features for identifying the messages or message elements are, for example,

30   data type, that is, fax, voice mail, e-mail, SMS, etc., and the length of the messages or the message elements. In this connection, data type and length of the messages or the message elements may be ascertained by control unit 30 in a suitable manner [known to one skilled in the art], for

35   instance, by evaluating the header information having the necessary specification, which is attached to the messages or

the message elements. The profile may also contain specifications specific to a terminal, which may not be influenced by the user, and which specify the resources available to terminal 5, for instance, the graphics capability

5   of an indicator device of terminal 5, the storage capacity of terminal 5 or the like as boundary conditions. However, it [can] may also be provided that the user himself specifies which of the functionalities that [can] may be implemented with terminal 5 are to be taken up into the profile. It is

10   already known from the publication "Composite Capability/Preference Profiles (CC/PP): A User Side Framework for Content Negotiation", W3C Note, July 27, 1999, how a user [can] may determine and change his profile.

15   Several such profiles [can] may also exist, so as, for example, to give general consideration to capabilities of different indicator devices of terminal 5, or capabilities of different terminal configurations, which may result from the fact that external components such as their own indicator

20   devices may be connected to terminal 5. Such an external component may be, for example, a laptop.

The settings for the current profile, [as a rule,] depend on the functionalities of terminal 5, which [are] may be

25   currently available to the user. Even more than today, in the future a mobile user will be able to connect external equipment to his mobile terminal 5 developed, for instance, as a mobile phone or mobile radio, in order to vary, in such a manner, the implementable performance capabilities, using

30   terminal 5, depending on need or what is offered. For reasons of mobility, size of the devices and stand-by time, many mobile radio devices will only offer basic functionalities, even in future. However, the user [can] may broaden these functionalities, for example, by coupling an electronic

35   notebook or an electronic organizer to mobile terminal 5.

If the user of terminal 5 wants to undertake changes in the
current profile, the [above-named] publication "Composite
Capability/Preference Profiles (CC/PP): A User Side Framework
for Content Negotiation" offers for this a bandwidth-efficient

5   solution. Via telecommunications network 10, developed as a
mobile radio network in this example, mobile terminal 5
transmits only the changes with respect to the previous
profile to storage device 25, which [is] may also be denoted
as profile database, and which [can] may also be arranged

10   outside matching device 15, in connection with it and assigned
to it. However, storage device 25 [can] may also be positioned
in matching device 15, as [shown] illustrated in Figure 2.
Thus, the complete current profile does not have to be
transmitted. Nevertheless, when there is a change in the

15   available functionalities of terminal 5, for example [because
of] due to the connection of another device to terminal 5, at
least the profile data changing in comparison to the previous
profile [must] may be transmitted to matching device 15.

20   According to the present invention, [it is therefore proposed
to permit] the user of terminal 5 may be permitted the use of
several, or any number of different profiles. Depending on
which external devices the user connects to his mobile
terminal 5, that is, depending on which functionalities [are]

25   may be currently available to him, he should then be able to
select a suitable profile from a list of his profiles.

For this purpose, the list having the different profiles is
stored in profile database 25. In each of these profiles, the

30   user determines which functionalities are available to him and
which properties the MMS service is to have with this profile.

The user [can] may give each of these profiles a profile name
that is as unique and as declarative as possible. In addition,

35   between mobile terminal 5 and profile database 25, identifying
characters, such as in the form of numbers, [are] may be

agreed upon for each of these profiles, so that a definite map
of an identifying character [is] <u>may be</u> possible for a profile
name of each profile and thus for the content of the
corresponding profile. A simple manner of agreeing on such

5   identifying characters between mobile terminal 5 and profile
database 25 is, for example, to number them in the sequence in
which they were stored in profile database 25. All the
profiles input by the user of mobile terminal 5 [are] <u>may be</u>
transmitted in an initializing phase from terminal 5 via

10   telecommunications network 10 to matching device 15 or rather
profile database 25 and stored in profile database 25, for
instance, in the sequence of their arrival. Additional
profiles defined and input by the user [can] <u>may</u> also [still]
be transmitted at a later point in time from terminal 5 to

15   profile database 25, in the manner described, and [can] <u>may</u>
there be stored, for instance, in the sequence of their
arrival.

Thus, for example, the user of a terminal 5 developed as a GSM

20   mobile radio device [can] <u>may</u> determine a first profile to
which he gives the name "pure GSM (SMS only)". In this profile
he will then determine that his GSM mobile radio device 5 only
supports SMS, and that, therefore, he does not want e-mails
present for him on an Internet e-mail server to be sent to him

25   automatically, but in this case rather have them left on the
Internet e-mail server. The same applies to other messages,
different from SMS messages, present for the user, which he
also wants to remain stored in the respective servers.

30   [He can] <u>The user may</u> apply a second profile for the case in
which he connects an electronic organizer to his GSM mobile
radio device 5. On the organizer he now also has a calendar
functionality which [can] <u>may</u> access an organizer server, [not
shown in Figure 2,] via mobile radio network 10 and MMS relay

35   15. In general, any desired number of servers or main
stations, respectively, [can] <u>may</u> be connected to matching

device 15 in the manner described in Figure 2. In this case, the user [can] <u>may</u> determine, in the second profile being marked, for instance, "GSM + organizer", to give an example, that not only SMS messages should be sent to him, but also

5   that the user should automatically receive updates of his calendar, such as when his secretary or colleagues change, add or cancel an appointment. Messages of other kinds, which [are] <u>may be</u> different from the message types named, should, according to the second profile, also remain stored on the

10   associated swerver.

He [can] <u>may</u> apply a third profile for the case in which he connects an electronic notepad to his GSM mobile radio device 5. On the electronic notebook he now has several possibilities

15   or applications. Therefore, in the third profile, which he calls, for instance, "GSM + notebook", he sets the following: With mobile terminal 5 thus broadened, not only SMS and calendar functionalities [can] <u>may</u> be implemented, but also, for example, e-mail and fax. Since, [as a rule,] <u>generally</u>

20   only urgent and important information [is] <u>may be</u> sent to him by fax, but he gets all kinds of messages by e-mail, he determines, for instance, in profile 3 that messages in SMS, calendar and fax formats are to be automatically sent to him, but e-mails are to remain on the Internet e-mail server.

25   Messages of other types, which differ from the types of messages named, should also remain stored on the assigned server.

In a fourth profile, the user of mobile terminal 5 will

30   consider the case, for instance, that he is not traveling in his home network but is staying outside the country, for example. In such a case, the applicable roaming fees [are] <u>may be</u> too high, so that he may indeed wish to continue to receive SMS messages, but only wants to be informed by SMS concerning

35   incoming calendar messages or faxes, without those being automatically delivered. E-mails and messages of other message

types, which differ from the types of messages named, should also remain stored on their associated server.

When beginning to use SMS service, according to the present
5   invention, the user needs further only to select that profile, on his list having profile names, which [is] <u>may be</u> stored in mobile terminal 5, and which corresponds to his wishes and the current functionalities of mobile terminal 5, or the additional current external devices or components that are
10   currently connected. In mobile terminal 5 this selection, this profile name is then mapped on the respective identifying character. This identifying character is then the only thing that has to be transmitted from mobile terminal 5 to MMS relay 15 via the air interface, or rather mobile radio network 10,
15   in order to start MMS service as desired. Because, via this identifying character, MMS relay 15 [can] <u>may</u> obtain the setting for the profile associated with the identifying character in profile database 25.

20   [One advantage of the present invention is particularly that the user has] <u>A user may have</u> to set the capabilities of his terminal 5, or [its] <u>the</u> possible combination of devices in the form of external additional devices or components connected to terminal 5, and his desired configuration of the
25   MSS servive, only one single time or [can let] <u>may allow</u> MSS relay 15 <u>to</u> set them at profile database 25. If there is a change in the device combination and/or in his wishes, he only has to select the matching profile from the list.

30   [A further advantage results in] <u>In</u> each case from the identifying character of the profiles[. As explained above], according to <u>one embodiment of</u> the present invention, it is not the information on the difference from the previous profile that has to be transmitted via the air interface, but
35   only the identifying character of the desired profile. This [saves] <u>may save</u> data, and thus, resources on the mobile radio

channel in mobile radio network 10, and [speeds] <u>may speed</u> up
the setting of the MMS service.

In MMS relay 15, data type conversions and/or data format
conversions are also performed as described. In dependence
upon the inputs of the user-defined profile or upon
terminal-specific standard inputs, messages or message
elements which are present in one of main stations 1, 2, 3 for
terminal 5 in a first data type, such as a fax or as text, are
changed to another data type, such as fax to graphic, or text
to voice. Correspondingly, a message present in a first data
format may be converted by MMS relay 15 into a second data
format. For example, a GIF graphic (graphic interchange
format) may be converted into a JPEG graphic (joint picture
expert group), or the text of a first alphabet may be
converted into the text of a second alphabet.

It may be provided that MMS relay 15 notifies terminal 5 if
new messages or message elements are not automatically passed
on to terminal 5, for example, according to the pull mode. To
this effect, notification of terminal 5 [can] <u>may</u> be done by
MMS relay 15 if messages or message elements, depending on the
input of the profile or profiles, are automatically passed on
to another mail system or are cancelled.

MM transfer protocol I between MMS relay 15 and MMS client
[must] <u>may</u> include, besides the functions for the transmission
of a message from matching device 15 to terminal 5, three
[essential] functional elements: [1.)] <u>1)</u> the possibility of
establishing a connection from MMS relay 15 to terminal 5, in
order to implement the push mode[. 2.)]<u>; 2)</u> the possibility of
establishing signaling from MMS relay 15 to terminal 5, in
order to notify terminal 5 of a message present in one of main
stations 1, 2, 3, in order to implement the pull mode[. 3.)]<u>;</u>
<u>and 3)</u> the possibility of establishing a connection from
terminal 5 to MMS relay 15, in order to retrieve a message for

terminal 5 stored in one of main stations 1, 2, 3, and thereby
to complete the pull mode or to send messages.

5   The present invention is described below, in [the] light of
three different *example* embodiments. Starting from Figure 3,
in Figure 4 layer sequences are [shown for a concrete]
illustrated for an example in which the MMS server is
[designed] *configured* as an Internet e-mail server, and
represents first main station 1. MM transfer protocol II is
10   here developed as SMTP or ESMTP. The SMTP or the ESMTP is
superordinated to MM transfer protocol I in assignment to air
interface U_u. The remaining layers correspond to the layers
[already shown] *illustrated* in Figure 3. Terminal 5 is an
SMTP-capable or an ESMTP-capable terminal. In the case of the
15   Internet e-mail server [shown] *illustrated* in Figure 4, an
Internet e-mail POP (post office protocol) server is involved.
The MMS client according to Figure 4 [is] *may be* developed in
this example as an SMTP client, i.e., an SMTP-capable terminal
5. The connection from MMS relay 15 to the Internet e-mail POP
20   server [is] *may be* identical to a classical Internet e-mail
configuration, in which a POP server stores all e-mails coming
in for POP client, and which checks POP client in regular
cycles to see whether new mail has come in for it on the POP
server. If so, they are loaded in their entirety into POP
25   client, in classical Internet e-mail configuration no MMS
relay 15 [being] *is* provided. The SMTP [is] *may be* provided as
transmission protocol which, as described, uses the TCP/IP
(transmission control protocol/Internet protocol), at least
for the IP interface.
30
In the first *example* embodiment according to Figure 4, MMS
relay 15 includes, for the IP interface, the described POP
client functionality according to the classical Internet
e-mail configuration. A new e-mail on the Internet e-mail POP
35   server [is] *may be* thus transmitted to MMS relay 15 in the
manner described for the classical POP client. MMS relay 15

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then determines, in dependence upon the profile entries stored in storage device 25, whether this e-mail, or which elements of this e-mail [are] <u>may be</u> forwarded directly to terminal 5 using push mode, and signals to terminal 5, perhaps

5   additionally, that there are present [still] further elements of this message for transmission to terminal 5 in pull mode, or that these are passed on to another mail system or are cancelled. If no element of the e-mail is transmitted to terminal 5 in push mode, only one notification [takes place]

10   <u>occurs</u> in one of the forms described. For example, the e-mail should now contain elements for both transmission modes, that is, for push mode and pull mode. [Hereby] MMS relay 15 combines the elements, provided for the push mode according to the profile, into a new message, establishes a transmission

15   channel to terminal 5 and sends these combined elements using SMTP. The other elements are also combined and sent via SMTP to the Internet e-mail server, so as to be passed on from there to another mail system, to be cancelled, or to be stored for the pull mode until retrieved by terminal 5. The

20   notification on the presence of message elements provided for the pull mode [can take place] <u>may occur</u> together with the transmission of the combined message elements in push mode or separately. If only one notification [takes place,] <u>occurs,</u> i.e.<u>,</u> if no message elements are present which must be

25   transmitted to terminal 5 in push mode, this notification [could take place] <u>may occur</u> using a message generated by MMS relay 15, which [is] <u>may be</u> transmitted to terminal 5 in push mode or uses special signalling channels, such as the SMS service according to the GSM standard.

30

If terminal 5 cannot be reached via communications network 10, those message elements [are] <u>may</u> also <u>be</u> stored, for example, in storage device 25 of MMS relay 15, which are to be transmitted to terminal 5 in push mode. Correspondingly,

35   notifications [are] <u>may be</u> stored intermediately in storage device 25 of MMS relay 15, which have to be transmitted by MMS

relay 15 to terminal 5 with respect to message elements that
are not to be transmitted in push mode. The storage of the
message elements which are to be transmitted in push mode
and/or of the notifications continues until MMS relay 15 is
5   notified, for example, by the HLR that terminal 5 [can] may
now be reached via telecommunications network 10. Thereafter,
transmission of message elements in push mode or of
notifications to terminal 5 [is] may be continued. The storage
of message elements and/or notifications [can take place] may
10   occur in this example in the Internet e-mail server or in MMS
relay 15.

Besides the transmission modes, the profile regulates, for
instance, conversions of data formats of messages, as [was] is
15   described above. If terminal 5 supports only the JPEG data
format in the case of graphics, this [is] may be entered in
the profile according to the standard, and MMS relay 15 may
automatically [converts] convert all graphics message elements
received for terminal 5 to JPEG format.
20
According to the first embodiment, POP is used as an example.
Alternatively, the IMAP (Internet message access protocol) or
other protocols available for this purpose could also be used.

25   Starting from the first example embodiment as in Figure 4,
Figure 5 [shows] illustrates a second example embodiment in
which the MMS server and MMS relay 15 are functionally
combined, which [can] may be advantageous for network-internal
services, such as voice mail/fax. In this connection, Figure 5
30   [shows] illustrates the protocol layer sequence of the MMS
client, known from Figure 4, as in Figure 4, and the first
protocol layer sequence 35 for air interface U_u of MMS relay 15
as in Figure 4. This protocol layer sequence is now shared by
MMS relay 15 and the MMS server in a common physical unit as
35   in Figure 5.

In Figure 6 [too], the MMS server and MMS relay 15 are
combined functionally into a physical unit[, however, rather]
for IP-based implementation. In this context, the MMS server
as in Figure 6 corresponds in its protocol layer sequence to
5   the Internet e-mail server as in Figure 4. This protocol layer
sequence [is] <u>may be</u> shared by the MMS server and MMS relay
15. The same protocol layer sequence [is] <u>may</u> then[, as
usual,] <u>be</u> selected for the MMS client as in Figure 6, air
interface U_u representing at the same time an IP interface
10   between the MMS client and MMS relay 15 or the MMS server.

In this connection, Figure 6 [shows] <u>illustrates</u> a third
<u>example</u> embodiment. All three <u>example</u> embodiments, as in
Figure 4, Figure 5 and Figure 6 may be used in common in MMSE.
15
Common to all implementations is the uniform service
functionality from the point of view of the MMS client, which
[is] <u>may be</u> ensured by MMS relay 15, MMS relay 15 being
developed either as a separate protocol element or as being
20   functionally integrated with the MMS server.

[Not only one, but several] <u>Several</u> terminals may be connected
to fourth interface 20 in the manner described, so that MMS
relay 15 may be used in the manner [decribed] <u>described</u> for
25   several terminals at the same time, at least one profile of
each of the connected terminals may be stored in storage
device 25 in the manner described.

[Abstract] <u>ABSTRACT</u>

A method [is proposed] for the transmission of messages between at least one main station [(1, 2, 3)] and a terminal [(5)] via a telecommunications network[(10)], and a matching

5   device [(15)] for it. The message exchange is controlled by matching device [(15)] between the at least one main station [(1, 2, 3)] and terminal [(5)] as a function of at least one input from terminal [(5)] or from the at least one main station[(1, 2, 3)]. The matching device [(15)] includes [for

10   this] at least one interface [(11, 12, 13)] to the main station[(1, 2, 3)], and one interface [(20)] to the terminal[(5)]. Furthermore, a storage device [(25)] is provided for storing at least one input from terminal [(5)] or from at least one main station [(1, 2, 3)] for controlling the

15   message exchange between the at least one main station [(1, 2, 3)] and the terminal[(5)]. Furthermore, a control unit [(30)] is provided which controls the message exchange as a function of the at least one input.